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10/081,834	02/22/2002	Laxmi P. Parida	YOR920010446US2	3116
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EXAMINER ZHOU, SHUBO				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/081,834

**Applicant(s)**

PARIDA, LAXMI P.

**Examiner**

Shubo (Joe) Zhou

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 April 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2 and 4-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2 and 4-17 is/are rejected.  
7) ☒ Claim(s) 2 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/CIS)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***RCE***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission including the amendment to the claims and the abstract filed on 4/25/08 has been entered.

### ***Status of Claims***

Claims 2 and 4-17 are presently pending and under consideration.

### ***Withdrawn Rejections/Objections***

The objection to the specification set forth in the previous Office action mailed 1/3/08 is hereby withdrawn in view of the amendment filed 4/25/08.

The rejection of claims 2 and 4-16 under 35 USC 101 set forth in the previous Office action mailed 1/3/08 is hereby withdrawn in view of the amendment filed 4/25/08, which added a step of "providing at least said at least one new motif as an output to a user, wherein said method is performed by a processor." Note that the rejection of claim 17 under 35 USC 101 is not withdrawn.

***IDS***

It is noted in the Office action (final rejection) mailed 1/3/08 by the examiner that in the IDS filed on 7/23/07, the source and publication date of Parida et al. are not listed on the PTO-1449 form. Given that Parida et al. is referenced in the specification on page 14 as being published on the Eleventh ACM-SIAM Symposium on Discrete Algorithms (SODA), 2000, it is so modified by the examiner on the 1449 form. Applicant was requested to respond if the examiner's modification is incorrect.

In response, applicant did not address the issue. More searching on the internet by the examiner reveals that The Eleventh ACM-SIAM Symposium on Discrete Algorithms (SODA) was specifically held on January 9-11, 2000. See "SODA 2000 program," printed from the internet at <<http://www.siam.org/meetings/da00/>> on 7/7/08.

Applicant is again requested to respond if the examiner's note is incorrect.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 17 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 17 is drawn to an article of manufacture comprising a computer readable medium and program codes thereon. Thus it is directed to a computer readable medium. While the instant specification does not explicitly define the scope of the limitation of "computer readable medium," one skilled in the art would understand that computer

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readable medium includes carrier wave, which is a signal. For example, Fickowsky et al., in US patent 6,090,555 (Date of Patent: July 18, 2000), define computer readable medium as being "a CD-ROM, floppy disk, tape, flash memory, system memory, hard drive, and a data signal embodied in a carrier wave." See column 14, claim 12. Bornstein et al., in US patent 6,1443,88 (Date of patent : Nov. 7, 2000) state, "The computer readable medium of the present invention generally includes a tape, a floppy disk, a CD ROM, a carrier wave. In a preferred embodiment, however, the computer readable medium of the present invention is a carrier wave." See column 8, lines 33-37.

Therefore, at least one embodiment of the instant claim 17 is drawn to carrier wave or a signal encoded thereon a computer program.

It was held by the court that claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such, are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material, e.g. a computer program, falls within any of the categories of patentable subject matter set forth in § 101. The following analysis on why such a signal encoded with functional descriptive material is nonstatutory subject matter is excerpted from the US PTO's "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (OG Notices: 22 November 2005, available from the US PTO website at <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/og200547.htm>):

*First, a claimed signal is clearly not a "process" under § 101 because it is not a series of steps. The other three § 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents §1.02 (1994). The three product classes have traditionally required physical structure or material.*

*"The term machine includes every mechanical device or combination of mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." Corning v. Burden, 56 U.S. (15 How.) 252, 267 (1854). A modern definition of machine would no doubt include electronic devices which perform functions. Indeed, devices such as flip-flops and computers are referred to in computer science as sequential machines. A claimed signal has no physical structure, does not itself perform any useful, concrete and tangible result and, thus, does not fit within the definition of a machine.*

*A "composition of matter" "covers all compositions of two or more substances and includes all composite articles, whether they be results of chemical union, or of mechanical mixture, or whether they be gases, fluids, powders or solids." Shell Development Co. v. Watson, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff'd, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958). A claimed signal is not matter, but a form of energy, and therefore is not a composition of matter.*

*The Supreme Court has read the term "manufacture" in accordance with its dictionary definition to mean 'the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.'" Diamond v. Chakrabarty, 447 U.S. 303, 308, 206 USPQ 193, 196-97 (1980) (quoting American Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11, 8 USPQ 131, 133 (1931), which, in turn, quotes the Century Dictionary). Other courts have applied similar definitions. See American Disappearing Bed Co. v. Arnaelsteen, 182 F. 324, 325 (9th Cir. 1910), cert. denied, 220 U.S. 622 (1911). These definitions require physical substance, which a claimed signal does not have. Congress can be presumed to be aware of an administrative or judicial interpretation of a statute and to adopt that interpretation when it re-enacts a statute without change. Lorillard v. Pons, 434 U.S. 575, 580 (1978). Thus, Congress must be presumed to have been aware of the interpretation of manufacture in American Fruit Growers when it passed the 1952 Patent Act.*

*A manufacture is also defined as the residual class of product. 1 Chisum, § 1.02[3] (citing W. Robinson, The Law of Patents for Useful Inventions 270 (1890)). A product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101.*

[.....]

*These interim guidelines propose that such signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of § 101. Public comment is sought for further evaluation of this question.*

Thus, claim 17 is drawn to nonstatutory subject matter.

### ***Claim Rejections - 35 USC § 112, First Paragraph***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2 and 4-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

The claims, e.g. claim 4, are amended to recite “providing at least said at least one new motif as an output to a user, wherein said method is performed by a processor.”

While the specification discloses that the method can be performed by a processor, e.g. on page 24, it does not adequately describe “providing at least said at least one new motif as an output to a user.” Applicant pointed out support for the limitation to page 24, lines 17-18 of the specification and claim 16 of the original disclosure. A review of these sections indicates that again, it only describes the method can be performed by a

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processor, but does not provide adequate support for “providing at least said at least one new motif as an output to a user.”

***Claim Rejections - 35 USC § 112, Second Paragraph***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 4-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites determining a plurality of first motifs, concatenating each with another of the first motifs, and then recites “removing one or more selected motifs of the concatenated motifs and the first motifs ...” (Emphasis added by the examiner). The metes and bounds of the limitation are not clear because if it is one motif is selected to be removed, it is not clear how the one motif could be selected from “the concatenated motifs and the first motifs.” Note the word “and” between the concatenated motifs and the first motifs. If it is only one motif is selected, it can only be either a selected concatenated motif or a first motif, but not both as required by the word “and” as indicated above.

Claim 4 first recites the steps of “determining,” “concatenating,” and “removing one or more selected motifs,” which comprises sub-step of “removing suffix motif,” then recites thereafter the steps of “offsetting,” “checking,” “augmenting,” and “providing.”



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The metes and bounds of the claimed invention are not clear because it is unclear whether all the steps after the “removing suffix motif” step are actually steps of the sub-step of ““removing suffix motif,” or steps in parallel with the step of “removing one or more selected motifs.” Clarification could be achieved by using proper indentations of the steps and sub-steps to make clear of the relationship among the steps and sub-steps.

Claim 4 recites “augmenting motifs that have the same location list to create at least one new motif.” The metes and bounds of the limitation are not clear because it is unclear what is meant by augmenting the motifs. Does it mean elongating the motif or more concatenating with other motifs, or else.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the

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various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(c), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 and 4-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parida et al. (IDS document: Pattern Discovery on Character Sets and Real-valued Data: Linear Bound on Irredundant Motifs and an Efficient Polynomial Time Algorithm, presentation on The Eleventh ACM-SIAM Symposium on Discrete Algorithms (SODA), held on January 9-11, 2000. See "SODA 2000 program," printed from the internet at <<http://www.siam.org/meetings/da00/>> on 7/7/08.).

The claims are drawn to a method and system for pattern discovery in an input sequence comprising determining a plurality of first motifs, concatenating each with another of the first motifs, removing selected motifs from the concatenated motifs and first motifs, offsetting each location list to zero, checking each location list to determine location lists that are the same, augmenting motifs that have the same location lists to create new motifs, and providing the new motifs to a user.

Parida et al. disclose a method and system for pattern discovery. The method comprises determining a plurality of first motifs referred to as irredundant motifs, concatenating each with another of the first motifs and determining location list of the motifs. Parida et al. also disclose a time algorithm to detect motifs. The algorithm is based on first detecting motifs or substrings of motifs, and then two agreeing motifs are

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concatenated to obtain a larger motif. At the end of each iteration, the set of budding motifs are trimmed so that they do not grow exponentially. This trimming step is interpreted being the same as the removing step of the instant claims. See at least page 298, and the mathematical basis is presented on pages 299-301. The method also comprises that when two motifs are found to have the same location list, they "must straddle." See page 301. The algorithm to detect and concatenate motifs is presented on pages 303-304.

Parida et al. do not explicitly state that the generated new motifs are outputted to a user.

However, given that the method disclosed by Parida et al. is a computer implemented using algorithm, it would have been obvious to one of ordinary skill that the new motif generated by the algorithm is displayed or outputted to whoever uses the program, i.e. the user.

Applicant is again requested to verify the publication date of this Parida (2000) article.

Furthermore, the Parida 2000 article also cite two publications that appear to be relevant to the instant application:

1. Parida, IBM Technical Report, 1999
2. Parida et al. An approximation algorithm for alignment of multiple sequences using motif discovery. To appear in Journal of Combinatorial Optimization, 1999.

Applicant's assistance of providing copies of these publications to the Office either via IDS or other means would be greatly appreciated.

### ***Claim Objections***

Claim 2 is objected to because it is not dependent from a preceding claim but rather a following claim.

### ***Conclusion***

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shubo (Joe) Zhou, whose telephone number is 571-272-0724. The examiner can normally be reached Monday-Friday from 8 A.M. to 4 P.M. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran, can be reached on 571-272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Shubo (Joe) Zhou/

**SHUBO (JOE) ZHOU, PH.D.**

**PRIMARY EXAMINER**